There are no meetings in July and August

Independence Day

Freedom has its life in the hearts, the actions, the spirit of men and so it must be daily earned and refreshed - else like a flower cut from its life-giving roots, it will wither and die.

~Dwight D. Eisenhower
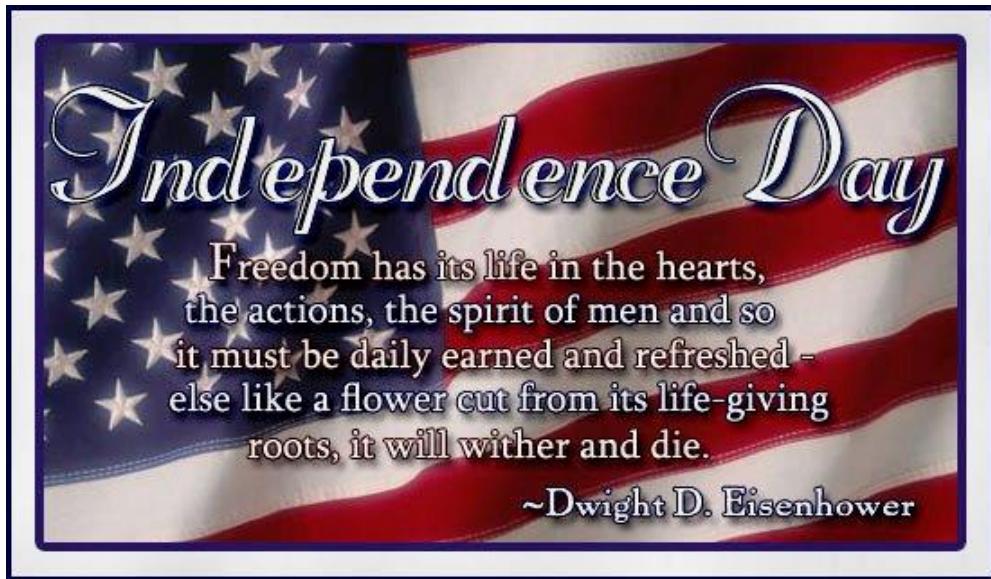
Inside - Barry K3EUI on Bandwidth - part 1

Blast from the Past

Here is more historic background on Phil-Mont from the *Blurb* archive scanned by WA3DSP.

Only this isn't from the *Blurb* at all; it's from the very first issue of the *TVI Retreat*, ancient single-page predecessor to our venerable newsletter. The date is December 1950 and the first announcement was that the next club meeting would be at the Lamberton School in West Philadelphia. Even then 10 Meters was monitored 24 hours a day and plans were afoot for nets on 75 and 20. The election of officers was scheduled for the January meeting along with, of all things, *an equipment auction!* What else was new? Well, for one thing, Editor and PMRC chief cheer leader, George King W3PXY, presaged the future when he wrote in this first club bulletin, "We'll try to get this blurb out once a month. We'll see how it works out."

Well Pixy, it seems to have worked out just right!   *de W3NE*

The ℬ*lurb* is published monthly by and for the members of The PHIL-MONT MOBILE RADIO CLUB, Inc., whose purpose is to promote Amateur Radio in general, and Mobile Radio in particular. *Copying and quoting* is permitted with a credit line. We gladly exchange publications with other amateur radio clubs. Requests should be sent to the Editor:
Rick DeVirgiliis ND3B@ARRL.net
Subscriptions are available to non-members for $12, addressed to the Treasurer.

Labels and mailing: **KB3IV**

Submissions deadline: All copy must be in the hands of the Editor by the 20th of the previous month.

Directors:

N3QV(15)
W3RM(15)
K3HWG(15)
WA3KIO(16)
KB2ERL(16)
ND3B(16)
W3STW(A)

Contact Phil-Mont: P.O. Box 404 Warminster, PA 18974
http://www.phil-mont.org
Website: Eric N3QV & Andrew KC2PMW
For club information: Contact any club officer, or the repeaters listed below. Address or club directory changes and articles for the membership e-mail list should be sent to: KB3IV

Sunday Morning Net Schedules
- **2 Meter/ 70cm Net**.................. at 0930L on W3QV repeater
- **10-on-10 Net** ...... at 1000L 28.393 MHz USB (±QRM)
- **75 meter Net** .... at 1020L 3.993 MHz LSB
- **ARES** at 2100L on the W3QV repeater

Committees
Blurb folding: KB3IV & N3GLU
Directory: KB3IV
Field Day: KC2PMW
Fusion Coord: NC3U

Internet: N3QV & KC2PMW
Membership: K3HWG
Net Control: KB3IV

Program: W3AOK
Publicity: W3RM
Refreshments: W3AOK
Repeater: W3AOK

Scholarship: W3RM
Sunshine: N3GLU
VE Program: NS3K
Welcome: N3UBY
Youth: KC2PMW

All visitors are welcome!
The club meets at 7:00 PM on the *second* non-holiday Wednesday each month except July and August at Giant Supermarket, 315 York Rd, Willow Grove, PA
Maps and directions are available at www.phil-mont.org.

License Examinations are held on the fourth **non-holiday Thursday** each month at
Community Ambulance Association, 1414 E. Butler Pike, Ambler PA 19002
Registration begins at 7:00 P.M. Applicants should contact Jim McCloskey NS3K at 215-275-2979 or jmccloskey@msn.com for the latest information.

Club Stations **W3QV/R: The Jim Spencer Memorial Repeater System**
Ridge & Port Royal Avenues, Philadelphia, PA *Trustee:* **W3RM**
147.03 MHz + PL 91.5 Hz   444.80 MHz + PL 186.2 Hz
Reach us on EchoLink through W3QV-R
W3AA *Trustee:* **WU3I**
W3EM: Field Day/special event station *Trustee:* **N3QV**

The Officers
President: **WA3GM Greg Malone wa3gm@yahoo.com**
Vice President: **W3AOK Bill Popovic w3aok@verizon.net**
Treas: **KB3IV Ed Masarsky kb3iv@comcast.net**
Secretary: **WU3I Steve Hoch wu3i@arrl.net**

The Prez Sez …
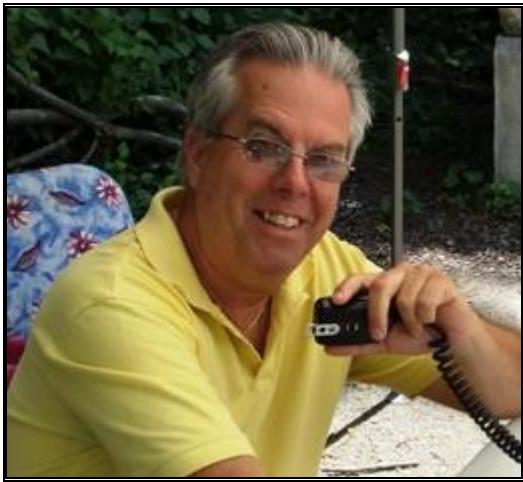
Hello Phil-Mont

Happy Summer Phil-Mont. Looks like we're into full swing already with a couple of heat waves under our belts and it's still June.

The Phil-Mont general meeting in June was most informative and again very well attended by members and visitors. I would like to thank Barry K3EUI one of our DEN Net Controls on Tuesday night for his excellent presentation on Capacitors. Great audience participation and just another "A" Plus evening for Phil-Mont

By the time you read this another Field Day will be in the books. Right now the Weather is not looking good for either day and the bands have been horrible due to a couple CME's so we will report back next month. Our field day coordinator Al W3STW has things well in hand so we will do our best. As always the highlight will be our own Top Chef Steve WU3I as we must feed the masses and keep them happy.

The following is a list of speakers for our meetings for the next few months:

July/August   Summer Break

September 9, 2015: Remote Operations. Greg WA3GM and Steve WU3I will present a short demo on working remote when it is not practical to bring Radios and antennas on vacation, etc…

If anyone has any suggestions for a speaker or would like to speak at one of our meetings please let any of the club officers or board members know. Your input is vital and we welcome all suggestions. Don't forget to sign up for the Phil-Mont Yahoo Group. We currently have 40+ members. This is a good way to share ideas amongst the membership. Sal NC3U is the moderator the group. For more info and to join the group contact Sal.

Everybody have a great and safe summer and we will see you in September.

See you all at the next meeting.

73, Greg WA3GM

Phil-Mont Birthdays &Tidbytes

July Birthdays

02 Ted Katz - N3OWM
   Alice Popovic (XYL W3AOK)
03 Nicole Bohlander (XYL WA3KLR)
10 Natalie Gordon - WB3KOH

16 Michael Davis - KB1JEY
17 Paul Lafollette - AB3SV

23 Art Weiner - WX3PHI
25 Jinny Haring - W3IIN

26 Mai-Lin (XYL N3BKR)
27 Robert Hill – KB3HNB
29 Jim Larkin - KA2FFP
31 Steve Hoch - WU3I

MEMBERSHIP STATS
At press time P.M.R.C. had:
105 FULL PAID MEMBERS
 11 FAMILY MEMBERS
  2 YOUTH MEMBERS
  1 HONORARY MEMBERS
  4 PENDING MEMBERS

The *Blurb*

ARRL VEC
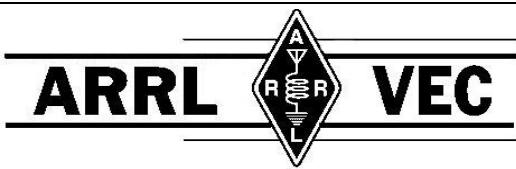
Thursday evening VE session on the 23rd this month.

As always, many thanks to our VE team!

From the Secretary

Minutes Board of Directors Meeting 6/3/2015
WA3GM opened the meeting at 7:19 after the arrival of WU3I and his driver KB2ERL. In attendance were K3HWG, W3STW, K3GBA, ND3B, WA3KIO and WA3DSP.
Treasurers report.
Some came in and some went out, but we got money.
Blurb
The editor's salary was tripled but the elevator repair was cancelled.
Repeater
GM reported that the Tuesday evening Digital education net needs the PL turned off for the net. We will see if this can be done with the scheduler. WA3GM to contact K3EUI.
VE Report
There were 12 examinees. All passed at least one element. One went from nothing to Extra.
Membership
New members voted in were KC3EXV, AB3SV, KC3DRE and WA3GTL. K3HWG made the motion to accept the applicants. ND3B Seconded. The motion was carried unanimously. Future to discuss new member discount for VE examinees.
Field Day
Band Captains: 160 WA3BXH, 80 KB2ERL, 40 WA3BXH will set up a Station to be operated. 20 K3FXR, 15 KB3SJS, 10 is open, GOTA is KB3IV

6 and 2 Meters are open as W3AOK will be out of town on business.
NEW BUSINESS
Next BOD meeting 9/2015
OLD BUSINESS
WU3I made the motion to disburse $100 to WA3DSP to purchase the DVD's for the Archive project. K3HWG seconded. Motion Carried. K3HWG made the motion to Adjourn W3STW Seconded. Motion Carried 8:14 PM

Minutes General meeting 6/10/2015
WA3GM opened the meeting at 7:13PM. There were 6 guests and 22 members present by the sign in sheet.
Field Day
W3STW reported we will be operating 160, 80, 40, 20, 15, 10, and 6 meters. We may or may not have a GOTA station. We are going to be missing some key operators this year and could use some new help.

Membership
K3HWG welcomed new members AB3SV and WA3GTL.
WA3GM won the 50-50(again) and donated the proceeds to the scholarship fund.
K3EUI gave an informative program on Capicators.

de Steve WU3I, Secretary

The following radio amateurs have applied for membership in PMRC

Ronald Wenig NY3J, Bensalem, Pa
Extra, Retired

J. Robert Witmer W3RW, Lansdale, Pa.
Extra, Program Manager – Retired

John Bates KC3CEW, Philadelphia, Pa.
Technician

Joe Fitzmeyer KC3ECE, Ardmore, Pa.
General, Industrial Sales

The *Blurb*

All about Bandwidth *de Barry, K3EUI*

One of the words I hear quite often when discussing digital modes is bandwidth. Bandwidth is a term used to describe how much spectrum a given mode requires at a prescribed signal level. Hams are restricted on the HF bands by a band plan; that is, some parts of each band are reserved for RTTY and other data modes, and other portions of each band are reserved for phone (voice and image), depending upon your license class. CW is allowed anywhere. Thirty meters is restricted to CW and data only. By separating various modes by the bandwidth they require would assume we have designed an efficient use of the HF spectrum, but these band plans precede the modern sound card digital modes by decades. There are proposals being considered now to separate modes by bandwidth, rather than by content.

So how is the bandwidth determined for any mode? In analog voice SSB operations (J3E) the typical bandwidth for good fidelity sound is about 2.7 kHz, or 300 Hz to 3000 Hz, but with slight reductions in the low and high end of the audio spectrum, SSB voice sounds intelligible if we limit the range from 500 – 2500 Hz, or a 2.0 kHz bandpass. In tight situations, when there is QRM, we might even be able to talk to folks with a high frequency cutoff of 1.8 Khz. Of course, I am talking about "analog" voice, not digital voice, and thinking about SSB, not AM or FM. Double-sideband, full carrier AM is about 6 kHz wide, yet it is still heard on 75 and 40 meters in narrow parts of the band (3880 kHz, 7290 kHz).

CW is the oldest mode and a very efficient use of radio spectrum. A clean CW signal occupies a bandwidth determined by two factors: the keying rate (wpm) and the shape of the on/off radio signal envelope; that is, how fast the radio goes from zero power to full power, and how fast it returns from full power to zero power. CW is really an "**amplitude shifted signal**" (ASK) and has sidebands, similar to AM voice. A steady key-down CW signal, or "dead carrier" has no bandwidth at all, other than noise generated in the oscillator. This on/off timing of a CW signal is often called the "**shaping**" of the keyed waveform envelope. If the shaping is too abrupt, that is, if the wave turns on/off too fast, then the signal occupies

a larger bandwidth, has many sidebands, and sounds "clicky" (remember the 60's?) with unnecessary harmonics. If the shaping is too slow, or too long, then the CW audio tone sounds mushy or soft to your ears making it hard to copy. Most CW stations today, using modern solid state radios, have excellent keying shape, with a "time constant" of about 5 milliseconds for turning on/off the radio wave. This results in a bandwidth of about 100 Hz – 200 Hz for moderate keying speeds (less than 30 wpm). One rarely if ever hears a lousy CW tone today on the HF bands. QST routinely publishes the "keying waveform" when it reviews HF radios, as shown below for the Kenwood TS590.

Figure 3 — Spectral display of the TS-590S transmitter during keying sideband testing. Equivalent keying speed is 60 WPM using external keying. Spectrum analyzer resolution bandwidth is 10 Hz, and the sweep time is 30 seconds. The transmitter was being operated at 100 W PEP output on the 14 MHz band, and this plot shows the transmitter output ±5 kHz from the carrier. The reference level is 0 dBc, and the vertical scale is in dB.

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Radio Teletype (RTTY) is a digital mode that requires a shifting between two radio frequencies, still called "MARK" and "SPACE" which are separated by 170 Hz. Using the common audio frequency shifting of the wave (AFSK) generated by a computer sound card with the rig in SSB mode means that the required bandwidth of a good RTTY signal is about 350 Hz. During contests, one can see that 350 Hz is a fairly large amount of bandwidth as RTTY signals often overlap each other, making copy of any one signal very difficult. A spectrum of a RTTY signal is shown below, generated by Ham Radio Deluxe.

The Blurb

Here is a PSK31 signal seen as a very narrow frequency plot on Ham Radio Deluxe
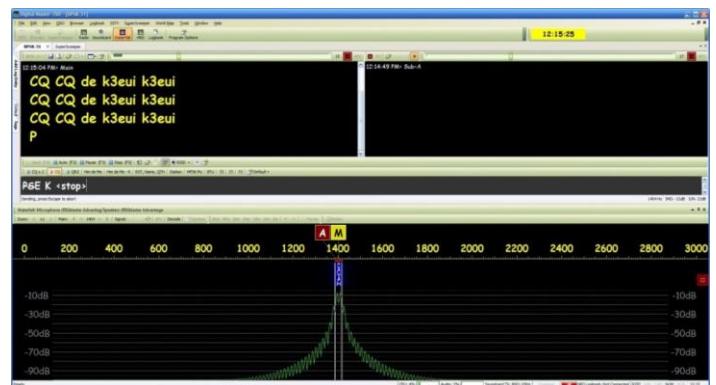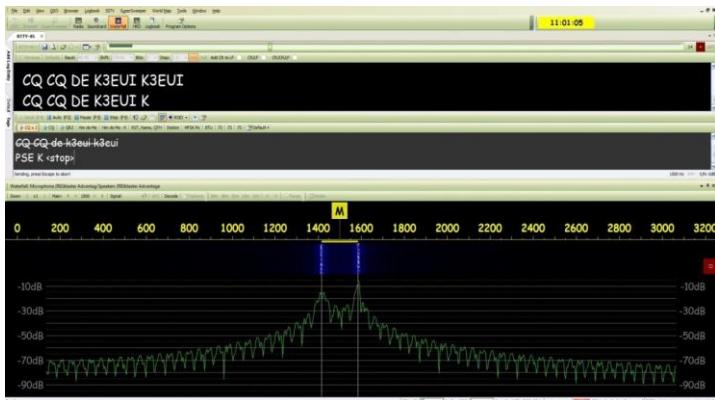
What if our goal were to create a digi mode with very narrow bandwidth and reasonable keying speed that is easy to generate in any PC sound card? **BPSK31** would probably be the mode of choice. Developed in the 1990's by Peter Martinez after the introduction and wide use of computer sound cards, BPSK31 is a very different modulation structure from CW and RTTY. BPSK31 **alters both the phase and the amplitude** of the RF envelope at a bit rate of 31 Hz, as shown in the picture below using AUDACITY to capture a PSK31 signal. Thus, if cleanly generated in the PC sound card, and not overdriven in an SSB transmitter, PSK31 occupies a bandwidth of about 60 Hz, even less than CW, and it moves at a typing speed of about 50 wpm, certainly fast enough for casual QSO's. One can see why PSK31 is so popular.

The shape of a PSK31 signal as seen on a FLDIGI waterfall.
Note the "phase change" occurs when the amplitude is zero, avoiding harmonics.
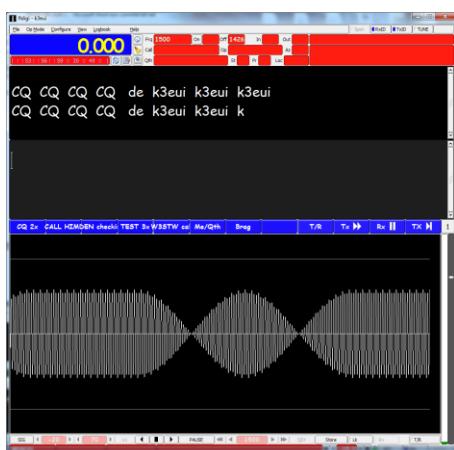
So how do we send more data in less time? If the goal is to send more data in a given amount of time, what exactly is required? The designer of the software can send each character in a shorter amount of time (increase the baud rate or decrease the time spent for each element) thus you now see PSK 63, PSK 125, PSK 250, PSK 500 and PSK 1000. The second number indicates the baud, or symbols per second. PSK 1000 is about 1600 words per minute.

The other method of increasing speed is to use "**multi-carriers**" (parallel sounds at a different frequency or pitch) which are each modulated separately in your sound card and software. Multi-carrier PSK modes are now in operation on the VHF/UHF FM bands where the extra bandwidth is permitted. You can hear them on the PhilMont DEN some nights and on the Chester County ARES nets (446.525) on Thursday evenings 8 pm.
PSK125RC16 is about the fastest mode for transmitting long files consistently over an FM analog repeater, being 1760 words per minute and occupying 2750 Hz of bandwidth.
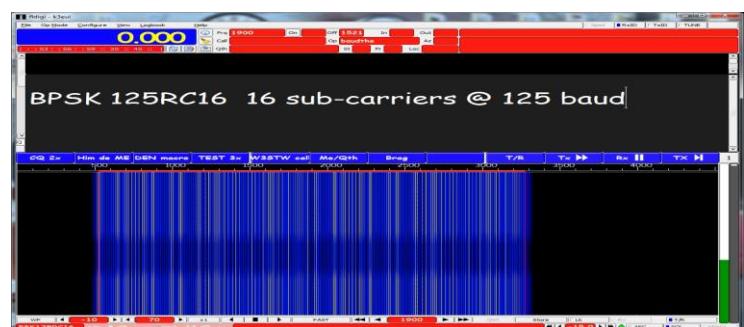
To be continued next month...

Barry, K3EUI

PRAYER REQUEST de WU3I

Fellow Club Members;

As I have had conversations with some of you I now know the extent of My Son's Brain Cancer. My Son Bryan Hoch N3VJE was diagnosed last April with Anaplastic Astrocytoma Grade 3 of 4. After a month of Radiation and almost a year of Chemo the Cancer has returned. It is now a grade 4 Glioblastoma a more aggressive form of Cancer.

Both last year and this year he had Brain surgery to remove the tumors. He is resting at home recovering from April 27 surgery. His spirits are good and he wants to fight, fight, FIGHT! Bryan is 32 years old and his birthday is July 8. He resides in West Philadelphia with his wife Kate and their two dogs Rudy and Gordon.

First step is clinical trials. Bryan and the doctors believe that Immunotherapy is the direction we should be exploring. These trials use either vaccines or your own T-cells to send your immune system into overdrive, which will in turn fight the cancer cells. Sometimes it's a monthly vaccine, sometimes it's an injection directly into the brain.

There are so many options and phases of trials I think researching the options will be a full time job. We are delegating to Bryan, Kate, and Jennifer to sort through it all. Joanie will help us research pros and cons of each trial but we will be applying for all of them.

Bryan automatically applied for the two Penn trials (one vaccine, one T-cell). The oncologist suggested Duke University and Dana Farber at Harvard for trials and Dr. Desai is emailing Harvard on our behalf. The surgeon suggested NYU and Columbia and he is reaching out to hospitals all over the NE and will be sending us a list with contacts and trial names. We will also contact the National institute of health to see if there are any we missed. Bryan is looking into other forms of treatments that we can talk about in person.

What we are asking for is PRAYERS. So many PRAYERS that he cannot be forgotten.

Please feel free to send copies of this notice anywhere you think will generate PRAYERS. Take a copy to your house of worship and have Bryan put on the prayer list. Thank You all for you help.

Stephen Hoch WU3I

Also in July

1 Canada day
   Postal worker day

8 Liberty Bell Cracks In 1835, while being rung at the funeral of John Marshall. (*Not* under warranty. Harumph.)

14 Bastille day

15 First Boeing 707 Flew In 1954.

20 Moon Day (First landing on the moon 1969, after 4 day flight)

23 Ice Cream cone Introduced In 1904.

24 Amelia Earhart Day
   Marvin the Martian debuted 1948.

27 Bugs Bunny debuted 1940.

31 First US Patent Issued to Philadelphian Samuel Hopkins in 1790 (for a process to make potash.)